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IS 8603 : 2008
[Amalgamating IS 8603 (Part 1) : 1977,
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(पहला पुनरीक्षण)

Indian Standard

DIMENSIONS FOR PORCELAIN TRANSFORMER BUSHINGS FOR USE IN HEAVILY POLLUTED ATMOSPHERES 12/17.5 kV, 24 kV AND 36 kV

(First Revision)

ICS 29.080.20, 29.180

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

September 2008 **Price Group 5**

Electrical Insulators and Accessories Sectional Committee, ETD 06

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Electrical Insulators and Accessories Sectional Committee had been approved by the Electrotechnical Division Council.

This standard was first published in three parts in 1977 which have been amalgamated in this revision.

After the publication of this standard, IS 8603 (Part 1) : 1977 'Dimensions for porcelain transformer bushings for use in heavily polluted atmospheres: Part 1 12 kV bushings', IS 8603 (Part 2) : 1977 'Dimensions for porcelain transformer bushings for use in heavily polluted atmospheres: Part 2 24 kV bushings' and IS 8603 (Part 3) : 1977 'Dimensions for porcelain transformer bushings for use in heavily polluted atmospheres: Part 3 36 kV bushings' shall be withdrawn.

The dimensions of the transformer bushings up to 36 kV for use in normal and lightly polluted atmosphere have already been covered in IS 3347 'Dimensions for porcelain transformer bushing for use in lightly polluted atmospheres' in the following parts:

a) Part 1 Up to and including 1 kV bushings
   Section 1 Porcelain parts
   Section 2 Metal parts

b) Part 2 3.6 kV bushings
   Section 1 Porcelain parts
   Section 2 Metal parts

c) Part 3 17.5 kV bushings
   Section 1 Porcelain parts
   Section 2 Metal parts

d) Part 4 24 kV bushings
   Section 1 Porcelain parts
   Section 2 Metal parts

e) Part 5 36 kV bushings
   Section 1 Porcelain parts
   Section 2 Metal parts

To avoid multiplicity of sizes, the dimensions given are only for those ratings (voltage and current), which are being used appreciably. Detailed dimensions have been given with a view to achieve maximum economy in the manufacture of bushings and ensuring their interchangeability.

The performance requirements of the bushings covered by this standard are given in IS 2099 : 1986 'Specification for bushings for alternating voltages above 1 000 V (*second revision)*'. The dimensions of porcelain parts given in this standard have been so arrived as to enable the use of same metal parts specified for transformer bushings for use in normal and lightly polluted atmosphere corresponding to the current and voltage rating.

The dimensions covered in this standard essentially apply to bushings used out doors with their lower ends immersed in insulating oil.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

DIMENSIONS FOR PORCELAIN TRANSFORMER BUSHINGS FOR USE IN HEAVILY POLLUTED ATMOSPHERES 12/17.5 kV, 24 kV AND 36 kV

(First Revision)

1 SCOPE

This standard lays down dimensions of the porcelain parts of the transformer bushings of 12/17.5 kV, 24 kV and 36 kV for use in heavily polluted atmospheres.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
3347	Dimensions for porcelain transformer bushings for use in lightly polluted atmospheres:
(Part 3/Sec 2) : 1982	17.5 kV bushings, Section 2 Metal parts (*first revision*)
(Part 4/Sec 2) : 1982	24 kV bushings, Section 2 Metal parts (*first revision*)
(Part 5/Sec 2) : 1979	36 kV bushings, Section 2 Metal parts (*first revision*)

3 DIMENSIONS

3.1 The dimensions of porcelain parts for 250, 400, 630, 1 000, 2 000 and 3 150A bushings for use in heavily polluted atmospheres are given in Fig. 1 to 10.

3.2 The insulator may be a single piece or can be provided with an insert at top end.

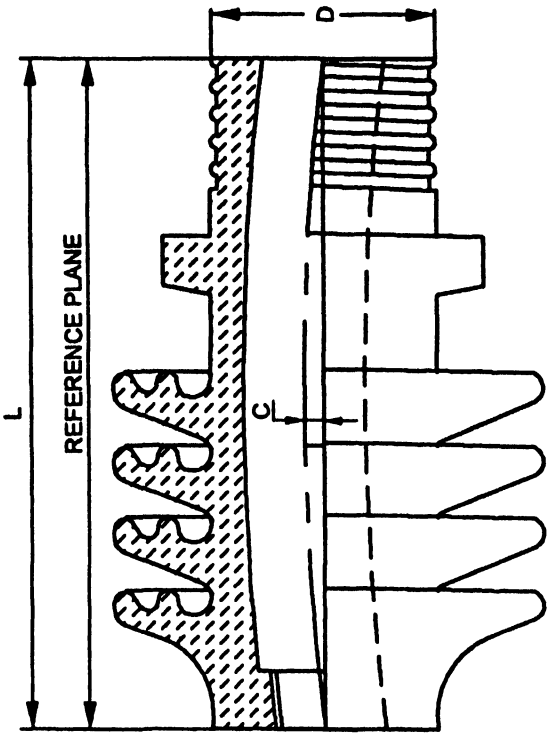
3.3 Unless specified otherwise, tolerance on a dimension shall be:

a) ± $(0.04\,d + 1.5)$ mm when $d \leq 300$ mm, and

b) ± $(0.025\,d + 6.0)$ mm when $d > 300$ mm.

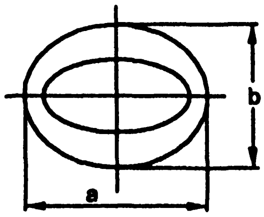
where 'd' is the dimension expressed, in mm.

For metal parts for these bushings, reference shall be made to IS 3347 (Part 3/Sec 2), IS 3347 (Part 4/Sec 2) and IS 3347 (Part 5/Sec 2).



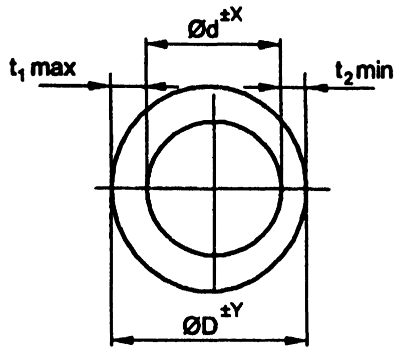
Nominal Height 'L' mm	*Camber 'C'* mm	
	2< (*L*/*D*) ≤ 4	(*L*/*D*) > 4
0 to 50	1.0	1.5
Above 50 and up to 70	1.2	1.5
Above 70 and up to 100	1.5	2.0
Above 100 and up to 200	2.0	3.0
Above 200 and up to 300	3.0	4.0
Above 300 and up to 400	4.0	5.0
Above 400 and up to 500	4.5	6.0
Above 500 and up to 600	5.0	6.5

FIG. 1 CAMBER



Nominal Diameter mm	*Out-of-Roundness* *a* – *b* mm
0 to 50	± 2.0
Above 50 and up to 75	± 2.5
Above 75 and up to 100	± 3.0
Above 100 and up to 125	± 3.5
Above 125 and up to 150	± 4.0
Above 150 and up to 175	± 4.5
Above 175 and up to 200	± 5.0

FIG. 2 PERMISSIBLE LIMITS OF OUT-OF-ROUNDNESS OF INSIDE AND OUTSIDE DIAMETER

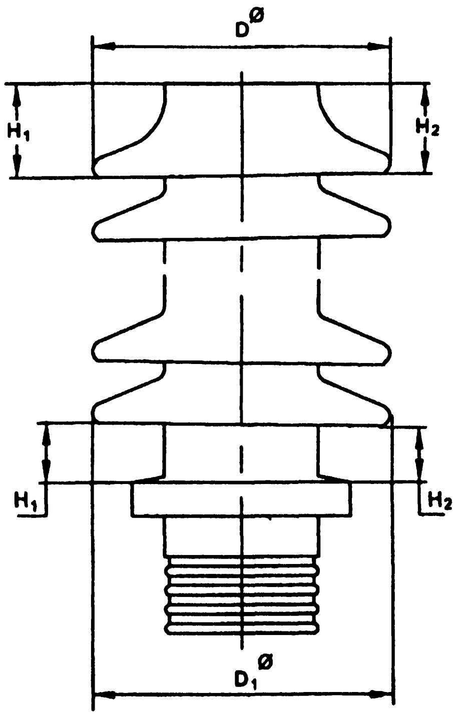


Nominal Wall Thickness mm	*Tolerance on Wall Thickness* mm	*Differential of Wall Thickness* ($t_1 - t_2$) mm
0 to 10	+a −1.5	1.5
Above 10 and up to 15	+a −2.0	2.0
Above 15 and up to 20	+a −3.0	2.5
Above 20 and up to 25	+a −3.5	3.0
Above 25 and up to 30	+a −4.0	3.5

NOTE — $a = \frac{x+y}{2}$

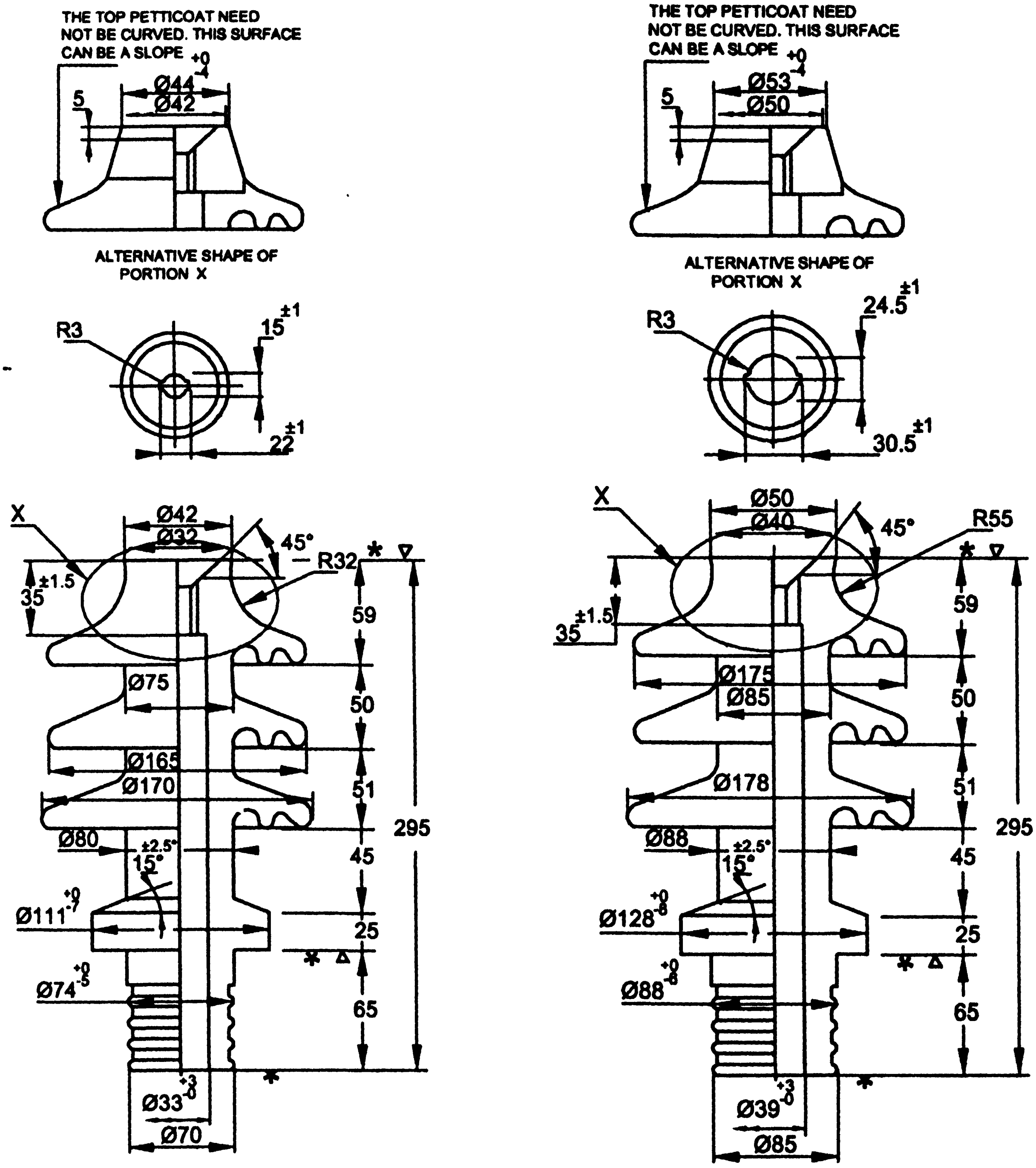
where x, y = diameter tolerance on internal diameter and stem respectively.

FIG. 3 TOLERANCES ON WALL THICKNESS



Nominal Shed Diameter *ØD* or *ØD*$_1$ mm	*Tilt of Shed* mm
0 to 100	±4.0
Above 100 and up to 200	±5.0
Above 200 and up to 250	±6.0
Above 250 and up to 300	±7.0

FIG. 4 TILT OF SHED



12,17.5 kV/250 Amps

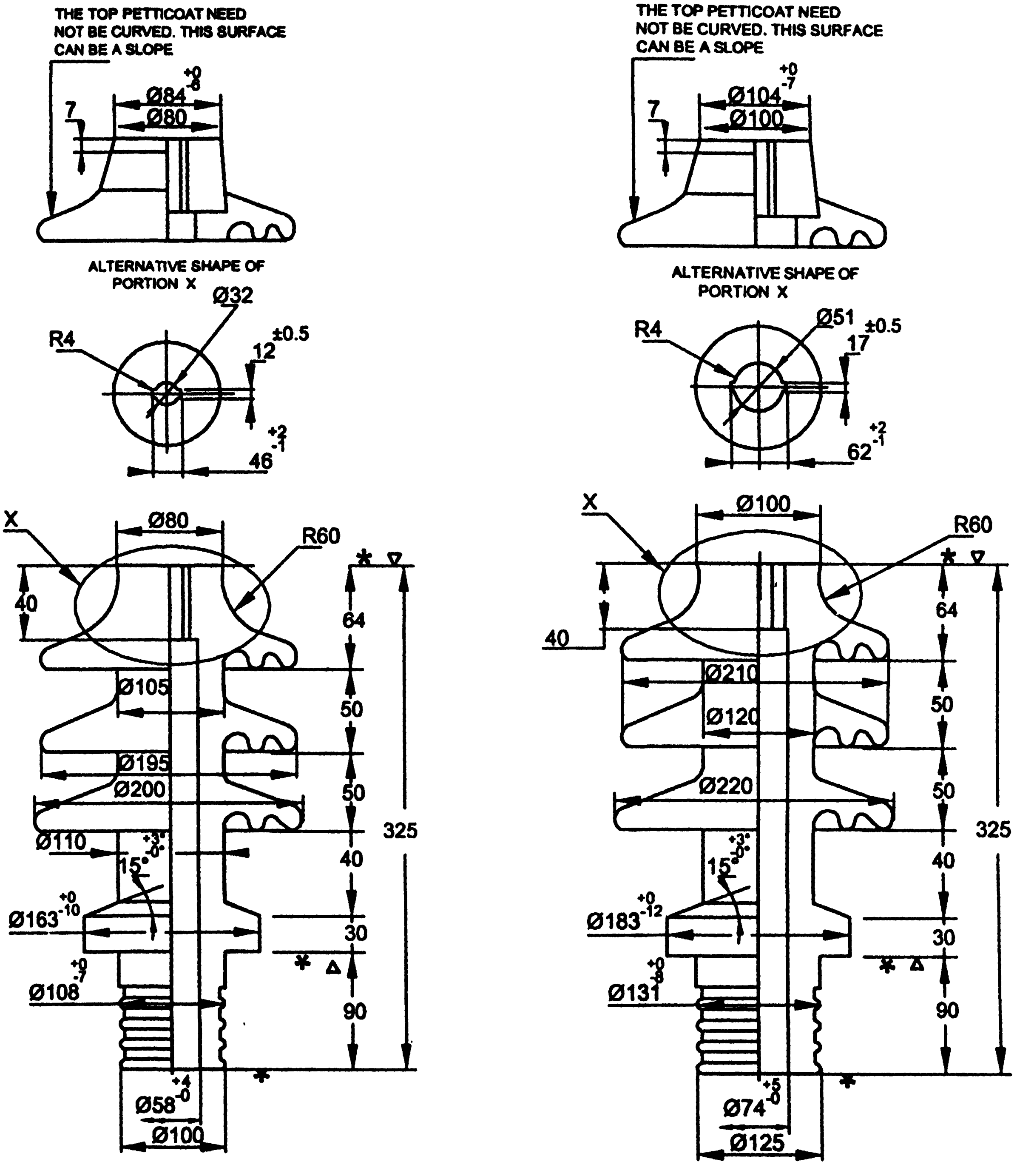
12,17.5 kV/400, 630 Amps

∇ Surface Ground Flat and Perpendicular to Axis

*Unglazed

All dimensions in millimetres.

Fig. 5 Dimensions of Porcelain Parts



12, 17.5 kV/1 000 Amps

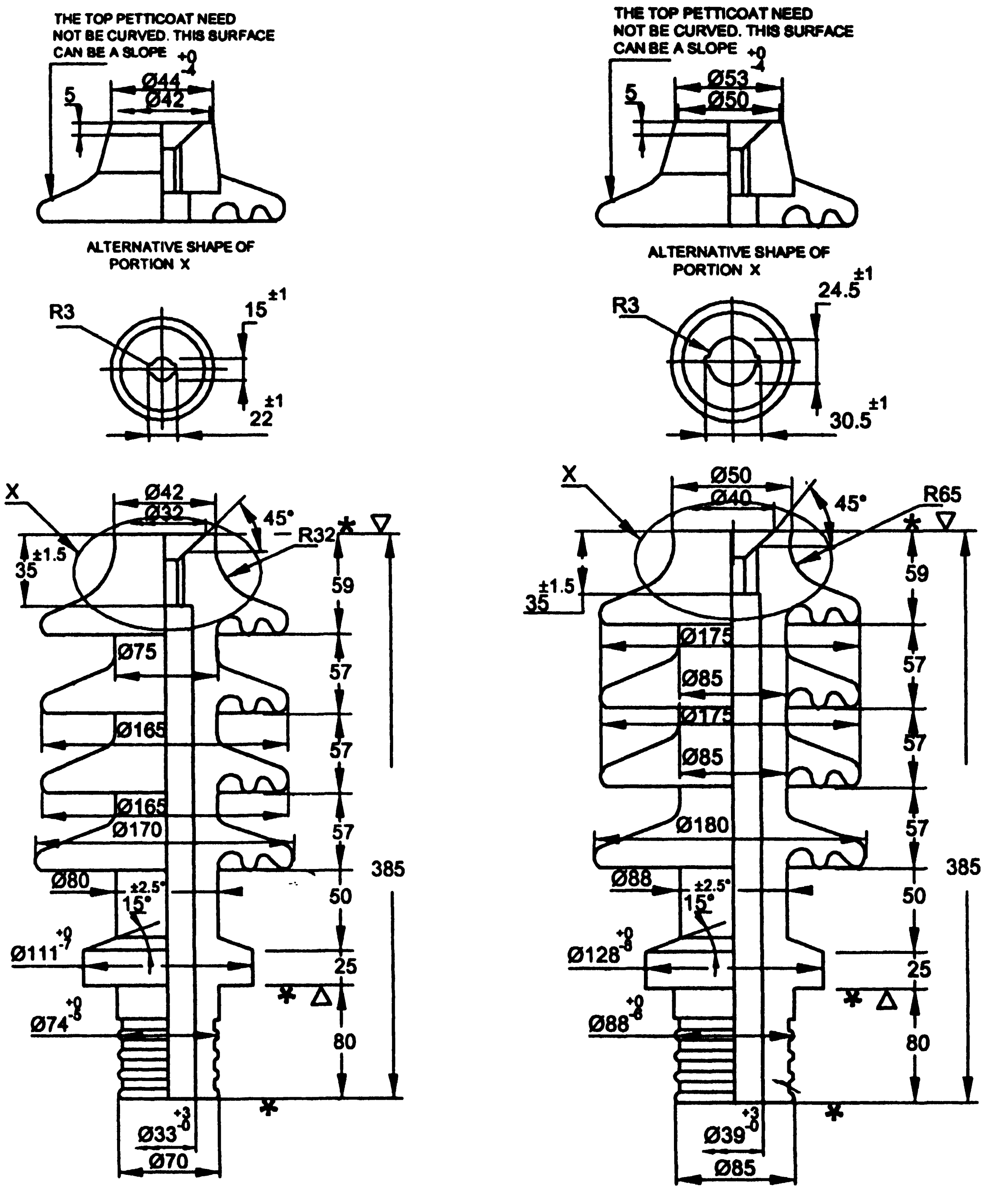
12, 17.5 kV/2 000, 3 150 Amps

∇ Surface Ground Flat and Perpendicular to Axis

*Unglazed

All dimensions in millimetres.

FIG. 6 DIMENSIONS OF PORCELAIN PARTS



24 kV/250 Amps

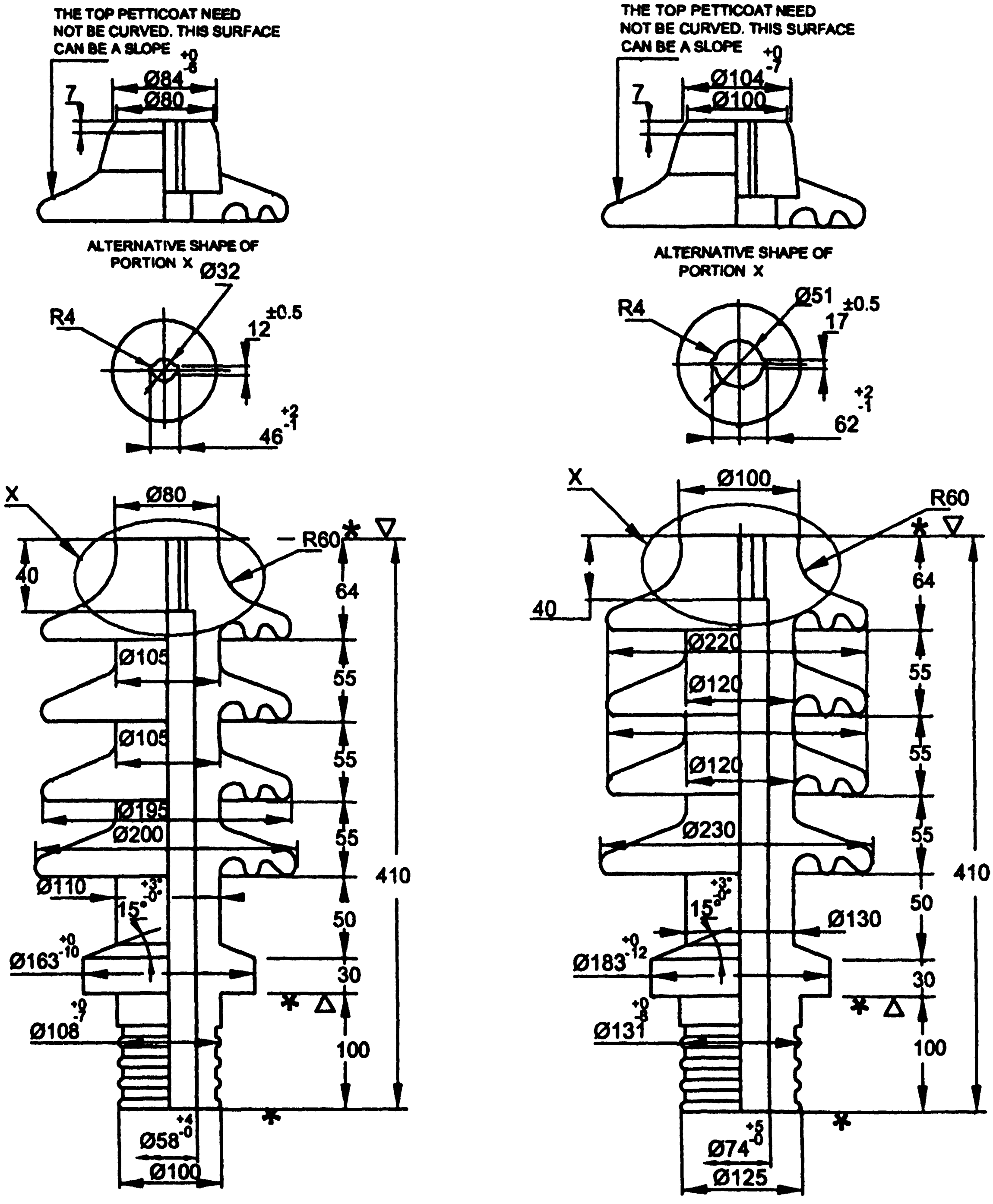
24 kV/400, 630 Amps

∇ Surface Ground Flat and Perpendicular to Axis

*Unglazed

All dimensions in millimetres.

FIG. 7 DIMENSIONS OF PORCELAIN PARTS



24 kV/1 000 Amps

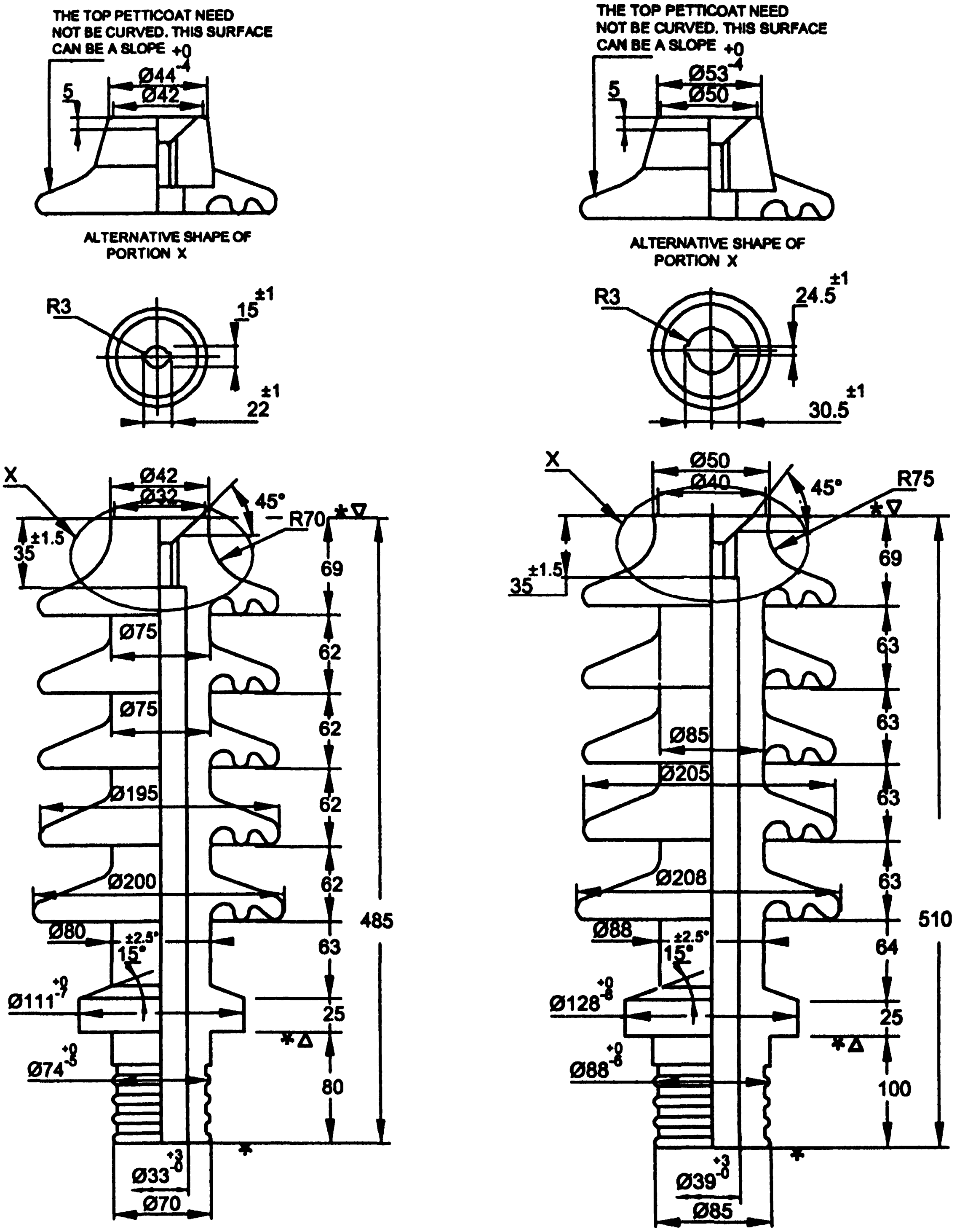
24 kV/2 000, 2 150 Amps

∇ Surface Ground Flat and Perpendicular to Axis

*Unglazed

All dimensions in millimetres.

FIG. 8 DIMENSIONS OF PORCELAIN PARTS



36 kV/250 Amps

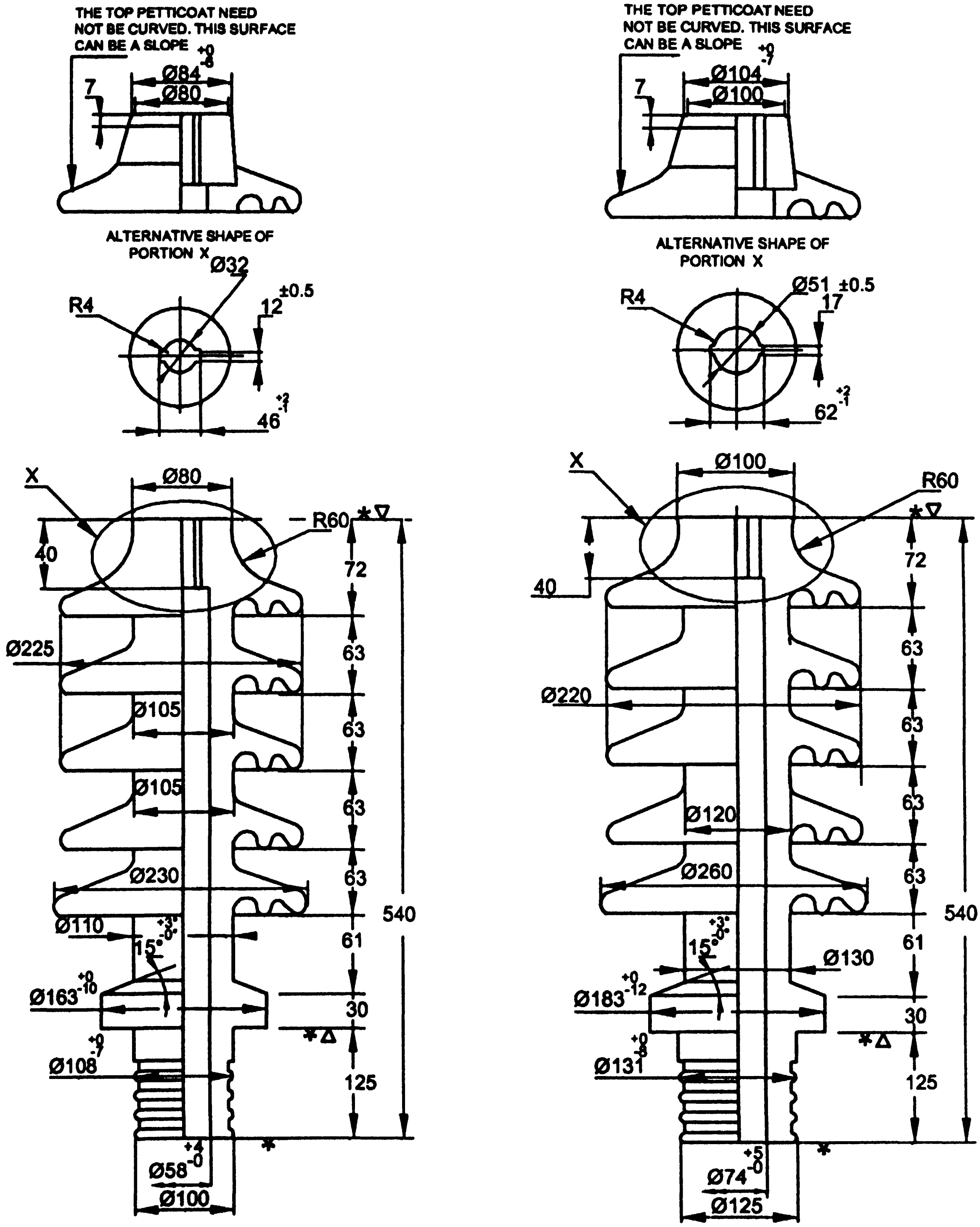
36 kV/400, 630 Amps

∇ Surface Ground Flat and Perpendicular to Axis

*Unglazed

All dimensions in millimetres.

FIG. 9 DIMENSIONS OF PORCELAIN PARTS



36 kV/1 000 Amps

36 kV/2 000, 3 150 Amps

∇ Surface Ground Flat and Perpendicular to Axis

*Unglazed

All dimensions in millimetres.

FIG. 10 DIMENSIONS OF PORCELAIN PARTS

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Amend No.	Date of Issue	Text Affected

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